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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,212	11/17/2003	J. Christian Swindal	1857.2020000	2451

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EXAMINER	
DETSCHEL, MARISSA	
ART UNIT	**PAPER NUMBER**
2877	

DATE MAILED: 03/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/713,212	SWINDAL, J. CHRISTIAN	
	Examiner	Art Unit	
	Marissa J. Detschel	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *14-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-25* is/are rejected.

7)☒ Claim(s) *15, 24, and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed on January 30, 2006 has been fully considered by the Examiner.

Response to Arguments

Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection. The new grounds of rejection are set forth below with respect to new claims 14-25 and new prior art under Holzapfel (USPN 5,428,445).

Claim Objections

Claims 15, 24, and 25 are objected to because of the following informalities:

As to claim 15, the phrase "eliminates interference between ghost or spurious reflections" in lines 2 and 3 of this claim should read "eliminates interference from at least one of ghost or spurious reflections." No interference is occurring between the ghost or spurious reflections in the system, but, rather, interference occurs in the system from at least ghost or spurious reflections.

Regarding claims 24 and 25, the phrase "the coherence length of the light beam that is less than" in lines 1 and 2 of this claims should read "the coherence length of the light beam is less than"

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 14-16, 18, 20, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzapfel (USPN 5,428,445) in view of Matsugu et al. (USPN 5,114,236).

Regarding claim 14, Holzapfel discloses a position determining system comprising:

a device that transmits a light beam (L12);

a lens system (212) that directs the light beam onto a portion of an object (A12 and B12); and

a sensor (D12) that receives light diffracted by the portion of the object via the lens system, the sensor configured to use the diffracted light to determine a position of the object (column 2, lines 12-19).

Regarding claim 20, Holzapfel discloses a position measuring method, comprising:

generating light having a coherence length (from L12);

directing the light onto a target (A12 and B12) using a lens system (212);

diffracting the light from the target to produce +/- first order diffracted beams (column 6, line 68 to column 7, line 1);

directing the +/- first order diffracted beams onto a combining element (D12) using the lens system (212);

combining the +/- first order diffracted beams using the combining element (column 7, lines 1-7); and

determining a position of the target based on an interference pattern generated from the combining step (column 2, lines 12-19).

Regarding claims 14 and 20, Holzapfel does not teach the use of superluminescent light as being diffracted from the target. The light is disclosed as being one of short coherence length, such as an LED (column 4, lines 21-23). The superluminescent light source used in applicant's invention is one that emits short coherence length light. Therefore, the LED and the superluminescent light diffract the same type of light (short coherence length light) off the target being tested. The superluminescent light of Applicant's device is brighter than that of the short coherence light of the LED of Holzapfel. It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the short coherence length light source (LED) of Holzapfel's device with a superluminescent light device (SLD) in order to increase the signal to noise ratio in the measurement device, due to the brighter superluminescent light, resulting in more accurate results.

Furthermore, regarding claims 14, 16, 20, 24, and 25, Holzapfel does not disclose that the coherence length of the light is less than a thickness of a lens in the lens system or less than a distance between lenses within the lens system. The coherence length of Holzapfel's light is disclosed as being one of short (or low)

coherence, as presented above. Matsugu discloses a method using a grating pattern to detect a position utilizing a light source of low coherency. Matsugu discloses that by using a light source of low coherency, it is possible to suppress unwanted light such as speckle that can be introduced in the measurement system (column 16, lines 41-46). This unwanted light can result in inaccurate measurement and should be suppressed as much as possible. By using a light source with high coherency (i.e. one where the coherence length is larger than a thickness of a lens in the lens system or larger than a distance between lenses within the lens system), this is not suppressed. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teaching of a low coherence light source such as the one in Matsugu's device in a device such as Holzapfel's position measuring device to suppress this unwanted light, resulting in a more accurate measurement of the position.

Regarding claim 15, Holzapfel does not disclose producing a light beam with a coherence length that substantially eliminates interference from at least one of ghost or spurious reflections caused by the lens system and the diffracted light beam. As stated above, Matsugu discloses that by using a light source of low coherency, it is possible to suppress unwanted light such as speckle resulting from the diffracted light reflected from the edges of the grating pattern (column 16, lines 41-46). This speckle is a representation of interference between spurious reflections caused by the lens system and the diffracted light beam. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teaching of Matsugu's low coherent light source in a position measuring device such as Holzapfel's in order to suppress any

unwanted light such as speckle from being introduced in the device, resulting in a more accurate position measurement.

Claims 17, 19, and 21-23 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Holzapfel (USPN 5,428,445) in view of Matsugu et al. (USPN 5,114,236) as applied to claims 14 and 20 above, and further in view of Alphonse et al. (USPN 4,821,277). Neither Matsugu nor Holzapfel disclose the specifics of the superluminescent device used in their position detecting devices. Alphonse discloses a superluminescent diode (superluminescent device) that presents the specifics of the technology behind the device.

In regards to claim 21, superluminescent devices generate superluminescent light.

Reagrding claim 17 and 22, Alphonse discloses that SLDs are typically made with an antireflection coating formed on the end surfaces that prevent lasing (column 1, lines 45-47).

In regards to claim 19 and 23, Alphonse discloses that SLDs provide a power output of a coherence length of less than 200 micrometers (column 1, lines 41-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the SLD of Alphonse in the devices of Matsugu and Holzapfel because the technology of the SLD presented is well known in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa J. Detschel whose telephone number is 571-272-2716. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on 571-272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marissa J Detschel
February 27, 2006
MJD

Gregory J. Toatley, Jr.
Supervisory Patent Examiner
5/Mar/06